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Making and Using Peanut Butter ¹

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DEVELOPMENT OF THE PEANUT-BUTTER INDUSTRY

The commercial production of peanut butter has developed to large proportions in recent years. In the early days of its manufacture peanut butter was made in sanitariums and used largely as a food for invalids, but its fine qualities and food value were soon appreciated, and it outgrew this limited use. At first peanut butter was manufactured in a small way by individuals and sold from house to house; then small factories sprang up and peanut butter became an article on the grocers' shelves. Today there are a number of large and small factories turning out peanut butter and other peanut products in great volume, and in addition to being considered an important luncheon delicacy it has become a standard article of food and is used in the preparation of various food combinations. Peanut butter of fair quality may be made in the home by the use of an ordinary cookstove oven for the roasting and a meat grinder for grinding the roasted peanuts. The quantity of peanuts now used annually in the manu-

¹ This circular supersedes the following publications:

BEATTIE, W. R. Peanut Butter. U. S. Dept. Agr., Bur. Plant Indus. Circ. 98; 14 pp., illus.

THOMPSON, H. C. The Manufacture and Use of Peanut Butter. U. S. Dept. Agr. Dept. Circ. 128, 16 pp., illus.

The section on Food Value and Ways of Using Peanut Butter, beginning on p. 13, was prepared by the Bureau of Home Economics.

facture of peanut butter is approximately 375,000,000 pounds as they come from the farms and before being cleaned and shelled. More peanuts are used in making peanut butter than for any other one purpose.

COMMERCIAL MANUFACTURE OF PEANUT BUTTER

In the manufacture of peanut butter only the best material should be used. High-grade butter cannot be made from inferior nuts. On the other hand, the best stock will not make good butter unless all the work of converting it into a high-grade product is carried on in the proper way and under sanitary conditions.

THE STOCK

Most peanut-butter manufacturers obtain their peanuts from cleaning and shelling factories, where they have already undergone the cleaning, shelling, and grading processes. This is generally considered the better method, although a few manufacturers prefer to buy farmers' stock peanuts and do their own cleaning and shelling as a matter of economy. In that case the cleaning and shelling should be done in a separate building, to prevent the dirt incident to the cleaning from getting into the butter.

The varieties of peanuts most commonly used in the manufacture of peanut butter are the Jumbo, Virginia Bunch, Virginia Runner, and Spanish. A few factories use the Virginia varieties alone, but the majority use a mixture of Jumbo, Virginia Runner or Virginia Bunch, and Spanish. It is thought by some that the Virginia varieties do not contain enough oil, and that the Spanish peanuts contain too much. For this reason a mixture of the two types is used.

As the peanuts come from the farms they have mixed with them considerable dirt and trash, which must be removed before they are ready for the market. After being cleaned, the shelling stock of the large-podded varieties of the Virginia type is separated from that to be sold in the shell. Peanuts of this type always include a small percentage of pods that have been damaged or discolored in the field. These, together with the pods that become broken in handling, are used for shelling. The greater part of the Spanish and Southeastern Runner varieties is shelled, as these varieties are not so popular as roasted peanuts.

Three grades of shelled peanuts are produced in the shelling factory: No. 1, which consists of the perfect, unbroken kernels; the No. 2, consisting of split kernels; and the No. 3, consisting of broken kernels, the shriveled or immature peas known as "pegs," also the germs or hearts that have been separated from the broken kernels. Only the No. 1 and occasionally the best of the No. 2 grade of shelled peanuts are used for the making of peanut butter. The third grade makes a very inferior product, which is unfit for human consumption. Both the peanut-butter and the peanut-candy industries have suffered in the past from the fact that the manufacturers have used so many shelled No. 2 peanuts in their products.

FACTORY AND EQUIPMENT

In selecting a location for a peanut-butter factory the transportation facilities, labor supply, and proximity to the raw material and to consuming centers should be considered. The factory building should be located near a railroad, so that a spur track or siding can be used for loading and unloading materials and supplies without having to haul them on trucks. The labor supply requires special attention, as usually most of the workers in a peanut-butter factory are women.

It is not necessary that the factory be located in a peanut-growing region, although such a location has some advantages. It is probably more important that it should be near the principal consuming centers, which are nearer the sources of supply of equipment, fuel, and accessories, such as bottles and jars. A factory located near a large consuming center has a longer haul for the raw product but a shorter haul for a large part of the finished article than the factory in the peanut-producing region.

The model peanut-butter factory consists of a four- or five-story building equipped and arranged for convenience and economy in handling the materials. The building should be light and airy and should be especially designed for good sanitation. Some factories have all the equipment on one floor, but this necessitates considerable trucking back and forth, or the use of conveyors, as a gravity system cannot be used in delivering the goods from one machine to another.

The equipment of a peanut-butter factory consists of roasters, blanchers, picking tables, grinders, bottle-filling, capping, and labeling machines, and the power necessary to run the machinery, together with elevator, chutes, and suitable facilities for storing, packing, and shipping the raw material and the finished product.

Probably the ideal arrangement in a four-story building is to have the roasting machinery and the stock of raw peanuts on the top floor; the blanching machinery and picking tables on the third floor; the grinders, bottling machines, and capping machines on the second floor; and the storage, packing, and shipping departments on the first floor. In this arrangement the materials come from the top floor to the bottom floor by gravity with the minimum of hand work required in carrying them from one machine to another.

As most peanut-butter manufacturers secure shelled goods from cleaning and shelling factories, the cleaning and shelling processes will not be discussed here.

ROASTING

In the manufacture of peanut butter from shelled nuts the roasting is the first operation, and in an ideal factory this is done on the top floor. The roasting machinery is made especially for the purpose, but is similar to that used in coffee roasting. Figure 1 shows a battery of roasters and cooling equipment. In some factories the peanuts are elevated to a hopper over the roaster and are fed by gravity through a chute into the roasting drum.

After the roasting is completed the peanuts are dumped from the drum into a hopper with perforated bottom and sides. This hopper

is built on a truck, which can be moved up to the roaster to receive the nuts and then moved back for the cooling. The cooling is accomplished by drawing currents of air through the peanuts and through the sides or bottom of the hopper by means of a suction fan.

In some factories natural gas is used for fuel, and in others artificial gas, coal, or coke is employed. The temperature is more easily controlled where gas is used. The length of time required for roasting peanuts varies with the temperature and the class of goods used. When the peanuts are fresh, early in the season, the roasting process requires a longer time than when the peanuts have become thoroughly dried.

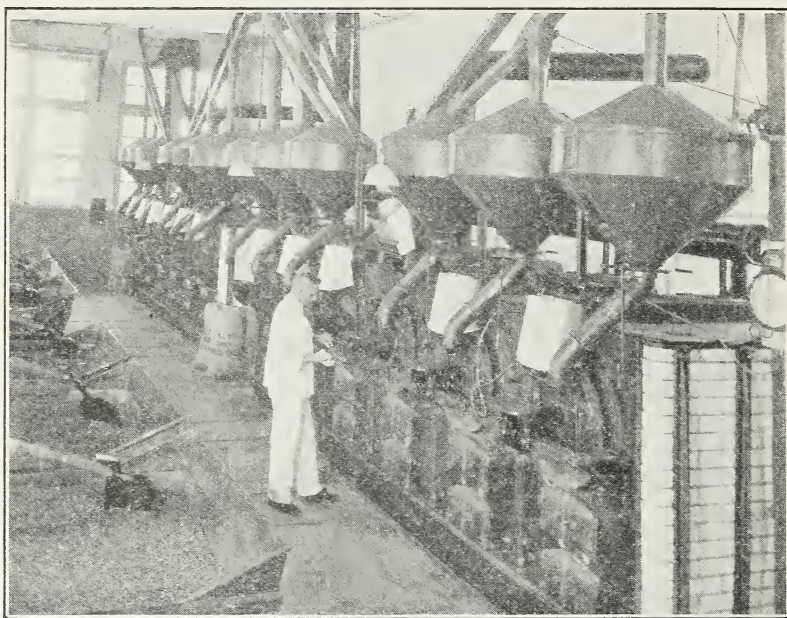


FIGURE 1.—Typical roasting and cooling equipment in a well-arranged peanut-butter factory.

A temperature of 350° to 400° F. is considered right for roasting shelled nuts, and at this temperature 40 to 50 minutes is required to roast a batch in the old style rotary roasters with indirect heat, the stage of roast being determined by the judgment of the operator. Figure 2 shows a new type of roaster in which flameless radiant heat is employed with full automatic control. Because of the rapid penetration of radiant heat the time required for each batch is reduced to 15 to 20 minutes or three batches per hour. With automatic heat control and accurate timing of the roast a more uniformly colored product is obtained. Color of peanut butter is an important factor, and where automatic temperature control is employed the butter made one day is identical with that made on other days. As retail trade is critical of this feature, this plan of color control is highly important. If the roasting process is carried too far or the tempera-

ture is too high the butter has a dark-brown color and a slightly scorched flavor. Peanuts that have been given a mild but complete roast are more palatable than those that are either underroasted or overroasted regardless of whether they are being used in peanut butter or for other purposes.

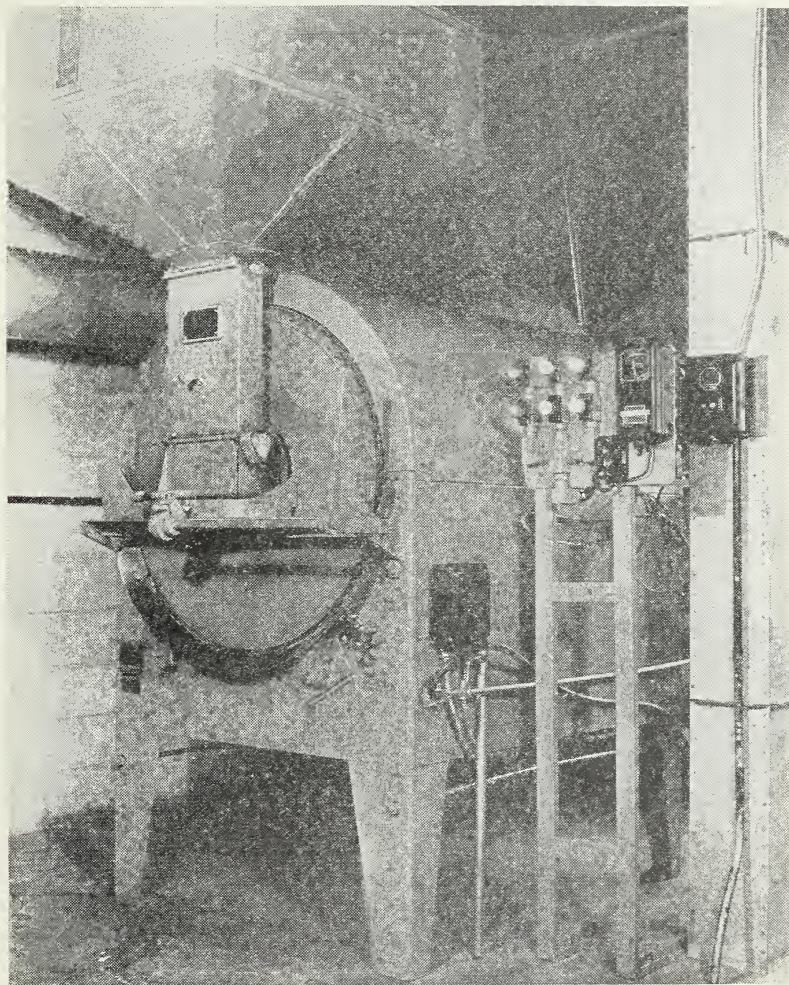


FIGURE 2.—A new type of roaster with radiant heat and full automatic temperature control.

The rapid cooling of the roasted nuts after they are dumped from the roaster is highly important and in modern factories is accomplished by drawing cool air downward through the batch of nuts by means of a powerful exhaust fan. In order to obtain uniform cooling the nuts should be stirred at intervals during the cooling process. After the nuts are cooled they are dumped into a chute through which they are carried to the blanching machines.

BLANCHING

The second operation in the manufacture of peanut butter is known as blanching and consists of the removal of the outer seed coat or

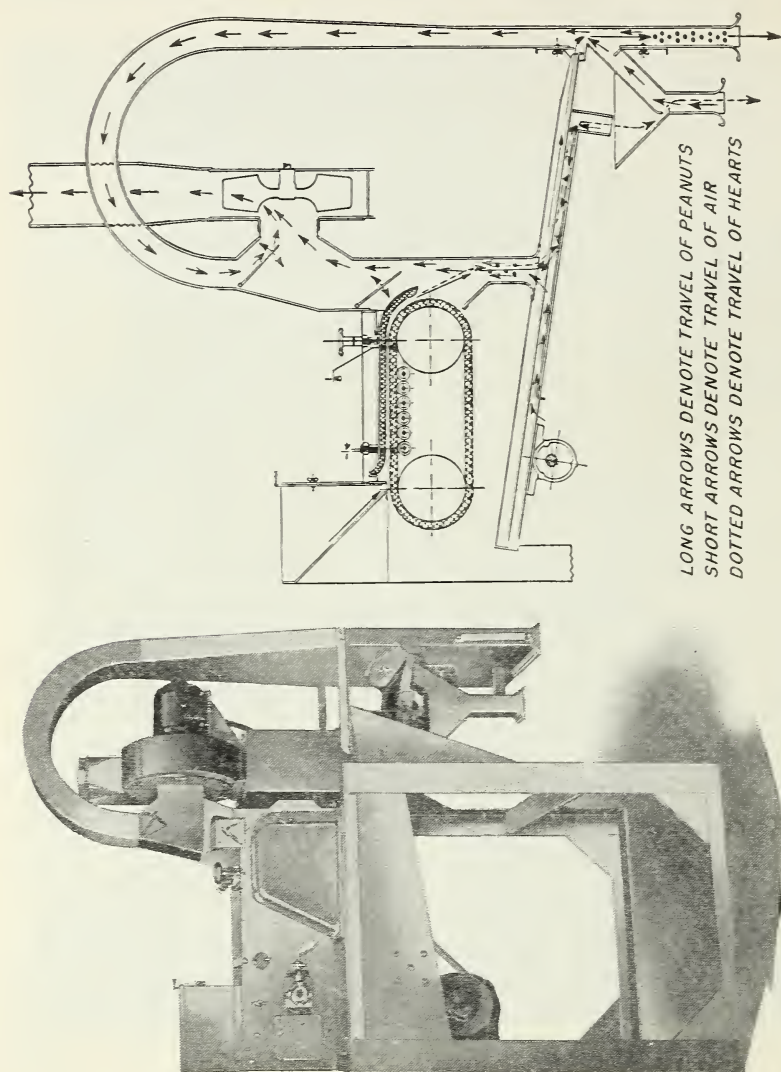


FIGURE 3.—Blancher for loosening and removing all red skins and germs.

red skins, splitting the halves of the nuts apart, and removing the little hearts or germs. This is accomplished by running the roasted and cooled nuts through special machines known as blanchers (fig. 3), which are equipped with screens to remove the germs and with suc-

tion fans to lift and carry away the red skins leaving nothing but the clean halves, except occasionally particles of stone or other material of greater density than the nuts.

It is absolutely necessary to remove every particle of the red skins and the germs in the production of high-grade peanut butter. The skins show in the butter as dark specks and the germs give the butter a bitter taste and cause it to turn rancid. The germs and skins

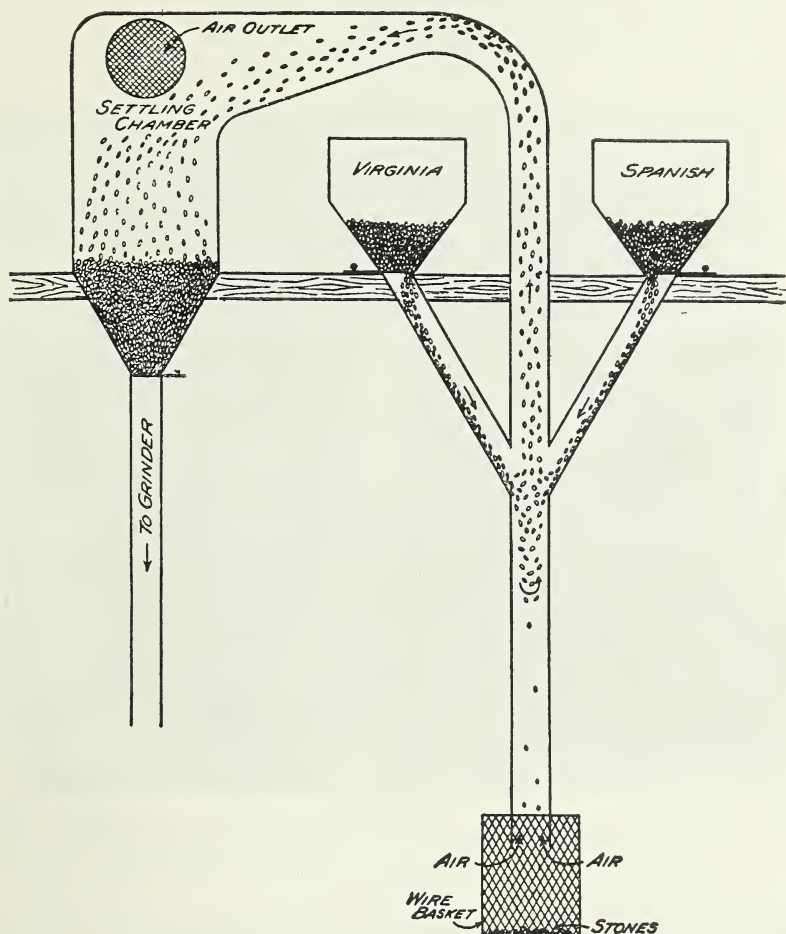


FIGURE 4.—Sketch showing a device known as a stoner boot used for removing stones and other heavy materials from the cleaned peanut meats.

are sold to feed dealers or to oil mills which press out the oil and dispose of the resulting cake or meal for stock feed.

In order to remove any foreign material the blanched nuts are fed through a device known in peanut-butter factories as a stoner or a stoning boot (fig. 4). In the stoner the nuts are lifted and borne on a strong draught of air to a higher level where they are deposited in a receiving compartment, and the stones and occasional pieces of

metal, being heavier, drop downward and are collected in the bottom of the chute.

The shrinkage of the peanuts during their manufacture into peanut butter will, as a rule, be approximately 18 percent for the large or No. 1 grade shelled Virginia nuts. This loss is mainly in the roasting but some of it is accounted for in the removal of the red skins and germs and any stones or inferior nuts that are picked out as the nuts pass over the picking tables.

HAND-PICKING

No matter how thoroughly the cleaning and grading are done in the cleaning and shelling factory, some hand-picking is necessary in the

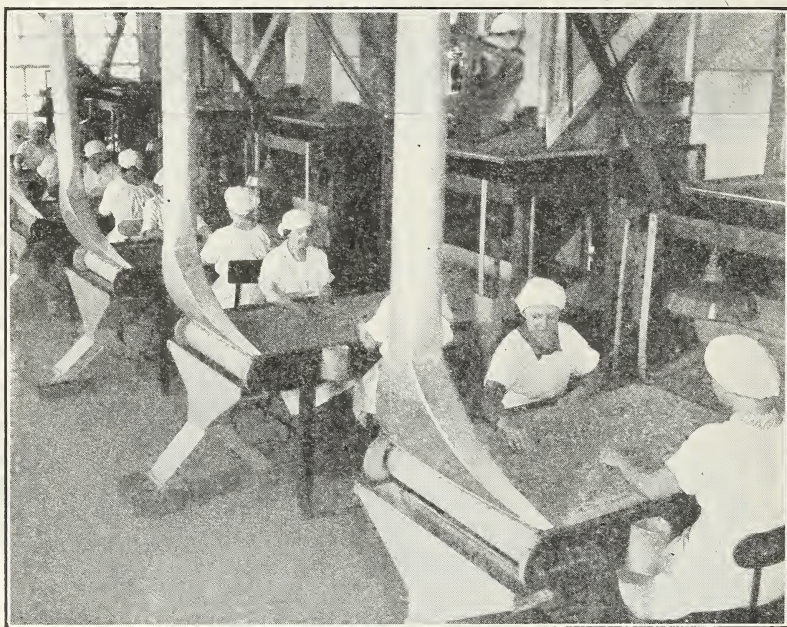


FIGURE 5.—Picking tables used in a peanut-butter factory. The peanuts, after being roasted and blanched, pass over these tables, and women remove foreign particles and all unblanched and discolored pieces of nut.

peanut-butter factory. The blanched meats usually pass from the blanching machines over a screen at the receiving end of the picking table, in order that any germs that have escaped the cleaning device of the blanching machine may be sifted out. After passing over these screens the peanut meats move slowly along on broad canvas belts alongside of which are seated women who pick out any unblanched or discolored nuts and any foreign matter which would lower the quality of the butter or detract from its appearance (fig. 5). The women who do the hand-picking are sometimes paid on the basis of the number of pounds of inferior material picked out.

From the picking tables the meats are drawn by suction into chutes which carry them to hoppers over the grinding machinery.

BLENDING

When two grades or kinds of peanuts are used in making peanut butter they are usually blended as they are fed into the hopper above the grinder. In one factory the blending is done in the stoner, two streams being fed side by side and blended by an air blast, as illustrated in figure 4.

Although some manufacturers use only one variety, others use a mixture of Virginia and Spanish peanuts. As a rule the blend is about 50-50, but in some cases a blend of 65 percent of the Jumbo or Virginia type and 35 percent of Spanish is used. The uniformity

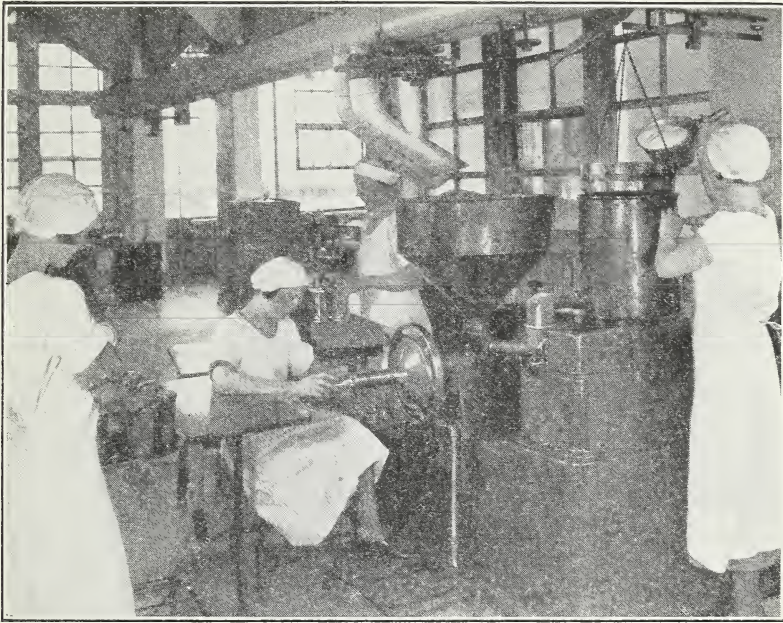


FIGURE 6.—A section of a peanut-butter factory, showing a grinding and bottling machine. Hopper containing salt on right of machine.

of the product where two varieties are used depends upon the completeness of the blend.

Virginia peanuts when used alone make a product lacking in smoothness unless very finely ground, but by the addition of Spanish stock the consistency is materially improved. The Spanish variety used alone makes a very smooth but rather too oily product. A better grade of peanut butter is produced by the proper blending of the Spanish with another variety having a lower oil content.

GRINDING

Commercial manufacture of peanut butter requires the use of special machinery for grinding the nuts. The butter should be brought to a fine granular form rather than a pasty consistency. When ground too fine the butter sticks to the roof of the mouth and

when too coarse it has an objectionable gritty feel. The aim in grinding peanut butter should be to avoid crushing the oil cells. Worn or smooth grinding plates when run closely together do not give good results, because the rubbing of the butter between them makes a pasty product which allows the oil to separate.

The grinding process produces considerable heat due to friction, and great care is necessary to prevent heating the butter. Some grinders have the working parts surrounded by a water jacket. By circulating hot or cold water through this jacket the temperature can be controlled.

Grinders of the type shown in figure 6, which are driven by a 5- or 6-horsepower motor, are now used in many factories. These

grinders have a capacity of 800 to 1,000 pounds per hour. A very small grinder is shown in figure 7.

Before the peanut meats are ground a small quantity of high-grade dairy salt is usually added. The proportion of salt varies from $1\frac{1}{2}$ to 3 percent by weight. Sometimes the salt is mixed with the peanuts before they reach the hopper of the grinder, but most grinding machines are fitted with a small auxiliary hopper from which the salt is fed into the machine with the peanuts by

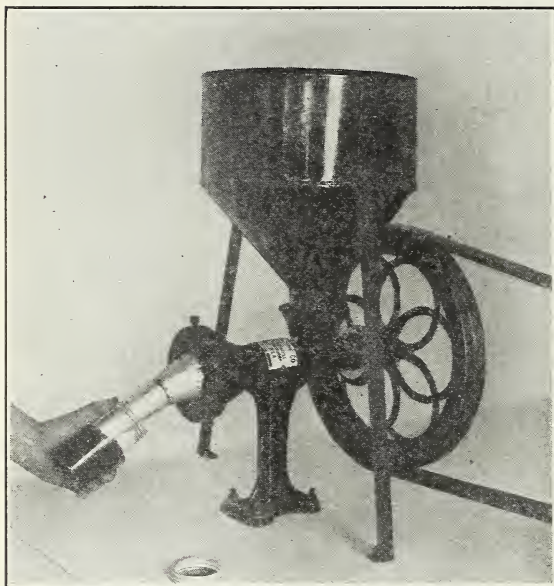


FIGURE 7.—A small peanut-butter grinder.

means of a worm or screw. It is very important to have the salt uniformly distributed through the butter.

Some manufacturers if requested will supply peanut butter without salt or with only a small amount, as many persons prefer it with little or no salt.

BOTTLING AND PACKING

Peanut butter is sold in glass bottles, glass jars, tin cans, pails, tubs, and barrels. Most of the retail trade is supplied with butter in bottles or in small glass jars.

The bottles or other containers are as a rule filled directly from the spout of the grinder, as shown in figure 6, but sometimes from a separate filling machine. The butter should be transferred from the grinder to a filling machine by means of a closed conveyor rather than by means of open tubs or pails. If it is necessary to use tubs or pails they should be kept covered, so as to keep out particles of

dust and dirt that may be in the air. Another method is to have the grinding machines on a raised platform, discharging directly into the filling machine. The only advantage in using a filling machine is to get the butter more thoroughly mixed, but that is not necessary with up-to-date grinders, especially when these are equipped with the auxiliary hopper for salt. Whether filled from the grinder or from the filling machine, the container should be filled directly from the spout, the operator holding the container against the spout with sufficient pressure to prevent the formation of air bubbles.

As the filled containers come from the grinding and filling machine they should go direct to the capping and sealing machine, where they are sealed under vacuum. Formerly the sealing was done in a

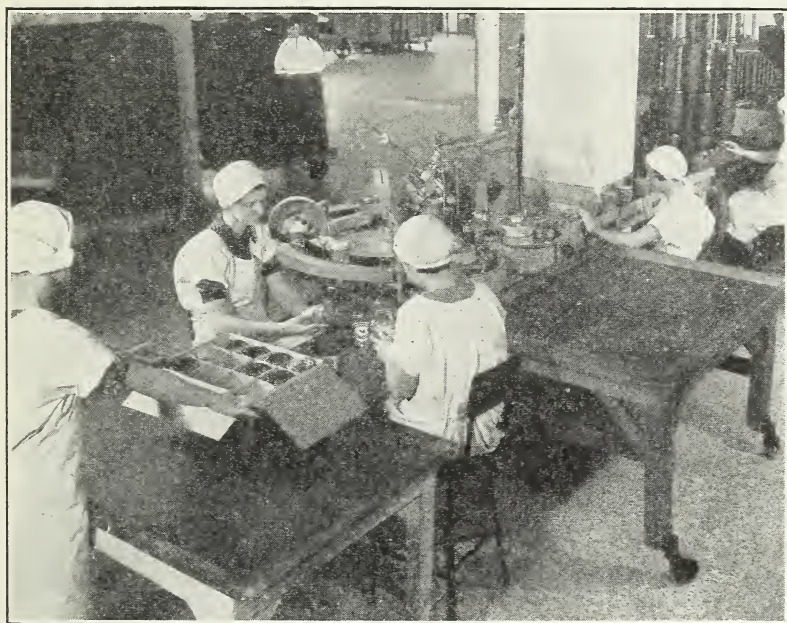


FIGURE 8.—Vacuum capping and sealing machine in background. Jar-labeling machine in foreground.

vacuum chamber, but in the most modern factories the air is exhausted and the lids are applied in a continuous-working sealing machine, as shown in the background of figure 8. Jars having rubber gaskets are not satisfactory, as the oil of the peanut butter softens the rubber. Paper gaskets and airtight friction lids are now used almost exclusively.

When pails or tubs are used for packing peanut butter they are provided with wood or metal covers held in place with wire, strips of metal, or nails, no attempt being made to make them airtight. Large containers are not satisfactory for peanut butter except for establishments using large quantities of the product. For the individual consumer or for family use small containers are more satisfactory, because the butter can be used before it deteriorates. The principal objection to the sale of bulk peanut butter is the fact that

the containers are frequently left uncovered in the stores and the contents exposed to dust, dirt, and insects. Unless the butter is sold within a short time after opening it may become rancid.

The bottles or glass jars containing peanut butter are labeled and packed in pasteboard cartons holding 1, 2, or 3 dozen. Although peanut butter packed in green jars might keep a little better than that packed in white jars if exposed to the sunlight, clear white glass jars are preferable to those made of glass of a greenish tint as the latter will give even the best peanut butter an inferior appearance.

Dealers handling peanut butter in bulk should bear in mind that the oil has a tendency to rise to the top. In order to have a uniform product it is desirable to stir the butter frequently with a wooden paddle. Consumers often complain that oil rises to the top of peanut butter in glass jars. When this happens it is only necessary to mix the oil thoroughly with the remainder of the contents by stirring with a spoon or knife.

HOME MANUFACTURE OF PEANUT BUTTER

From what has been said about the commercial manufacture of peanut butter it is evident that the process is very simple. Usually, nothing is taken from the peanuts except the germs and skins, and nothing is added except a small quantity of salt. Many persons have the idea that peanut butter consists of ground peanuts mixed with oil. As shelled peanuts contain from 35 to 50 percent of oil, depending on the variety, it is unnecessary to add oil. The only difference between ground peanuts and peanut butter is in the fineness of the particles.

A cheap, wholesome peanut butter can be made at home by means of an ordinary meat grinder. Raw unshelled or raw shelled peanuts can be bought from dealers and roasted in the oven at home, or peanuts that have been roasted can be obtained. When roasting peanuts in the oven care should be taken to prevent their burning. The nuts should be stirred from time to time in order to get a uniform roast. Greater care is necessary in roasting shelled than unshelled nuts, as shelled nuts are more easily scorched. By examining the peanuts from time to time during the process the desired degree of roasting can be obtained. Shelled peanuts can, as a rule, be roasted in about 20 minutes in an oven heated to approximately 350° F. or what is considered a moderate bake-oven temperature.

When unshelled peanuts are used they should be roasted in the shell and cooled. After being cooled, they should be shelled and blanched. The blanching can be accomplished by rubbing the meats over a wire-bottom screen. This rubbing removes the skins and loosens the germs. If the screen has holes of the proper size the germs can be sifted out. The meats can be readily cleaned by being poured from one vessel to another in the open, where the wind will blow out the skins, after which they should be hand-picked.

When the meats have been cleaned they are ready for grinding. Salt may be added before or after grinding. A good type of meat grinder is satisfactory for grinding the peanut meats provided the burs are not worn. The finest burs should be used, and the machine should be set to grind the meats as fine as possible. If the butter is

not fine enough after being run through the machine once, it should be put through again. When salt is not added to the nuts before they are ground it is advisable to add it to the paste before the second grinding.

In order to be sure of a good grade of peanut butter it is best to make it often rather than to make a supply which will last for several months. When made at home the peanut butter actually costs much less than when bought in stores; in fact, it should not exceed 15 or 20 cents a pound, a very low price for a product of such high food value.

FOOD VALUE AND WAYS OF USING PEANUT BUTTER

Like all nuts the peanut is rich in fat, and like all legumes it is rich in protein. Moreover, the quality of the peanut protein is superior and supplements the protein of wheat in making the peanut-butter sandwich, for example, a particularly nutritious combination, as well as a happy blend of flavors. The peanut has other food values besides fat and protein. It is a good source of phosphorus and a fair source of iron, and a good source of vitamin B.

Peanut butter is a very concentrated food, however, and therefore is not only more palatable but more easily digested if the texture is changed by combining it with other foods. Though its most common use is in sandwich fillings, it gives good flavor to soups, stuffings, and sauces for creamed and scalloped dishes. It is used in omelets, salads, breads, cakes, and frostings. The following recipes show the wide range of uses of peanut butter.

PEANUT BUTTER SANDWICHES AND CANAPÉS

Between slices of bread, or on crackers or rounds of toast, peanut butter alone or in any of the following mixtures makes good sandwiches or canapés:

Stir into the peanut butter a little cold milk or cream, to make a smooth, creamy paste. After spreading, cover with a layer of tart jelly. A sandwich with this filling is especially good if toasted.

Blend thoroughly $\frac{1}{2}$ cup of peanut butter, $\frac{1}{3}$ cup of salad dressing, and $\frac{1}{4}$ cup of tart chili sauce.

Blend $\frac{1}{2}$ cup of peanut butter, $\frac{1}{2}$ cup of cream cheese, 2 tablespoons of cream, and dashes of tabasco sauce and salt to taste.

Blend $\frac{1}{2}$ cup of peanut butter with the mashed yolks of 6 hard-cooked eggs, $\frac{1}{2}$ cup of mayonnaise, 1 to $1\frac{1}{2}$ tablespoons of lemon juice, $\frac{1}{4}$ teaspoon of salt, and a few dashes of tabasco sauce. Use with a thin slice of Bermuda or Spanish onion in the sandwich or on the canapé.

Add to any of these mixtures, after spreading on the bread or crackers, a layer of cream cheese, softened with a little cream. Top each canapé with a thin slice of stuffed olive.

PEANUT BUTTER IN SALADS

Hard cook 6 eggs, remove the shell, and cut in half. Mash the yolks and blend with $\frac{1}{2}$ cup of peanut butter, $\frac{1}{2}$ cup of mayonnaise, 1 to $1\frac{1}{2}$ tablespoons of lemon juice, $\frac{1}{4}$ teaspoon of salt, and a few dashes of tabasco sauce. Stuff the egg whites with this mixture and serve on a bed of cress, endive, or shredded cabbage, with either French or mayonnaise dressing.

Stuff cooked prunes, apricot halves, or other fruits with peanut butter and press together to form balls. Serve on crisp lettuce with any desired dressing.

Mix $\frac{1}{2}$ cup of peanut butter, 2 tablespoons of cream, $\frac{1}{2}$ cup of finely cut celery, and salt to taste. Form into balls and roll in finely cut raisins. Serve on a mixture of crisp greens with a French dressing.

CREAM OF PEANUT BUTTER SOUP

1 quart milk	$\frac{1}{2}$ to $\frac{3}{4}$ teaspoon salt
2 slices onion	Tabasco sauce
2 tablespoons flour	Parsley
$\frac{1}{2}$ cup peanut butter	

Heat $3\frac{1}{2}$ cups of the milk in a double boiler with the onion. Blend the flour and the remaining cold milk; add to the hot milk, cook, and stir until thickened. Mix the peanut butter with some of the hot sauce and add to the remainder in the double boiler. Season to taste with salt and a few drops of tabasco sauce. Remove the onion before serving, and stir in the finely chopped parsley.

PEANUT BUTTER AND TOMATO SOUP

1 No. 3 can tomatoes	1 tablespoon flour
$\frac{1}{2}$ teaspoon salt	$\frac{1}{2}$ cup peanut butter
$\frac{1}{4}$ cup water	

Simmer the tomatoes for 5 minutes, then press through a sieve to remove the seeds. Mix some of the hot tomato juice with the peanut butter until smooth. Blend the flour and water and salt. Add both mixtures to the remaining tomato juice. Boil gently for about 2 minutes, stirring constantly.

PEANUT BUTTER SAUCE

2 cups milk	$\frac{1}{4}$ teaspoon salt
$\frac{1}{2}$ cup peanut butter	Sour pickles or relish, if desired

Heat the milk in a double boiler. Mix a little hot milk with the peanut butter, gradually add the remainder of the milk, stir until thoroughly blended, and cook in a double boiler until thickened. Add the salt and season to taste with finely chopped pickle or relish. Use as the sauce for making scalloped or creamed rice, macaroni, potatoes, or other vegetables.

SCALLOPED ONIONS WITH PEANUT BUTTER

8 to 10 medium-sized onions, cooked	$1\frac{1}{2}$ cups peanut-butter sauce 1 cup buttered crumbs
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Place a layer of the sliced cooked onions in a greased baking dish, cover with the peanut butter sauce, and repeat until all the onions and sauce are used. Cover the top with buttered crumbs and bake in a moderate oven for about 20 minutes, or until the crumbs are golden brown. Serve from the baking dish. Cabbage, cauliflower, or other vegetables may be used in the same way.

PEANUT BUTTER OMELET

4 eggs	$\frac{1}{2}$ teaspoon salt
4 tablespoons milk	1 tablespoon butter or other fat
4 tablespoons peanut butter	Parsley

Separate the eggs and beat the yolks until thick. Add the milk, peanut butter, and salt, and beat again. Fold this mixture into the stiffly beaten egg whites. Melt the butter or other fat in a frying pan and pour in the mixture. As soon as the omelet browns slightly on the bottom, place it in a moderate oven (350° F.) and bake for about 10 minutes. Crease the omelet through the center, fold it over, roll it onto a hot platter, sprinkle with chopped parsley, and serve at once.

PEANUT BUTTER BISCUITS

2 cups sifted flour	4 tablespoons peanut butter
$\frac{3}{4}$ teaspoon salt	2 tablespoons fat
4 teaspoons baking powder	Milk

Sift the dry ingredients, and rub the peanut butter and fat into the flour with the tips of the fingers. Make a well in this dry mixture and, stirring from the center, slowly add enough milk to make a soft dough. Knead slightly, pat to about one-half-inch thickness on a lightly floured board, and cut in rounds. Bake in a hot oven (400° F.) for about 15 minutes, or until lightly browned.

PEANUT BUTTER DROP COOKIES

$\frac{1}{2}$ cup peanut butter	2 teaspoons baking powder
$\frac{1}{2}$ cup sugar	$\frac{1}{4}$ teaspoon salt
1 egg	$\frac{1}{2}$ cup milk
1 cup sifted flour	

Mix the peanut butter, sugar, and beaten egg. Sift together the dry ingredients and add alternately with the milk to the first mixture. Drop by teaspoonfuls onto a greased baking sheet about an inch apart. Bake in a moderate oven (350° F.) about 15 minutes, or until lightly browned.

PEANUT BUTTER CUP CAKES

$\frac{1}{2}$ cup butter or other fat	4 teaspoons baking powder
$\frac{1}{2}$ cup peanut butter	$\frac{1}{2}$ teaspoon salt
1 cup sugar	1 cup milk
2 eggs	1 teaspoon vanilla
3 cups sifted soft-wheat flour	

Cream together the fat, peanut butter, and sugar. Add the beaten eggs and the sifted dry ingredients alternately with the milk. Add the vanilla. Bake in greased muffin tins in a moderate oven (350° F.) for about 20 minutes.

PEANUT BUTTER FROSTING

1 cup sugar	$\frac{1}{4}$ teaspoon salt
4 tablespoons cold water	2 tablespoons peanut butter
1 egg white	

Put the sugar, water, and unbeaten egg white in the upper part of a double boiler, and have the water in the lower part boiling. Commence beating the mixture with a Dover egg beater at once and beat constantly while it cooks for about 10 minutes, or until it holds its shape well when dropped from the beater. Add the peanut butter and beat again until the frosting thickens. Remove from the fire and continue beating until it again holds its shape when dropped from the beater. Cool the cake thoroughly before spreading with this frosting.

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<i>Office of Foreign Agricultural Relations</i> -----	LESLIE A. WHEELER, <i>Director</i> .
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<i>Bureau of Agricultural Economics</i> -----	H. R. TOLLEY, <i>Chief</i> .
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<i>Commodity Exchange Administration</i> -----	JOSEPH M. MEHL, <i>Chief</i> .
<i>Bureau of Dairy Industry</i> -----	O. E. REED, <i>Chief</i> .
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<i>Farm Security Administration</i> -----	C. B. BALDWIN, <i>Administrator</i> .
<i>Federal Crop Insurance Corporation</i> -----	LEROY K. SMITH, <i>Manager</i> .
<i>Forest Service</i> -----	EARLE H. CLAPP, <i>Acting Chief</i> .
<i>Bureau of Home Economics</i> -----	LOUISE STANLEY, <i>Chief</i> .
<i>Library</i> -----	RALPH R. SHAW, <i>Librarian</i> .
<i>Bureau of Plant Industry</i> -----	E. C. AUCHTER, <i>Chief</i> .
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